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Cape Cod Community College

PCB Remediation Plan
Risk-Based Disposal and Cleanup
Nickerson Cape Cod History
Archives Renovations
Cape Cod Community College

Rev. #1

2240 Iyannough Road
West Barnstable, Massachusetts

April 5, 2013

ARCADIS

Budd Batchelder
Project Scientist

Allen R. Walker, PE, LSP
Principal Environmental Engineer

PCB Remediation Plan
Cape Cod Community College
2240 Iyannough Road
West Barnstable, Massachusetts

Prepared for:
Cape Cod Community College
Prepared by:
ARCADIS U.S., Inc.
194 Forbes Road
Braintree
Massachusetts 02184
Tel 781.356.7300
Fax 781.356.2211

Our Ref.:
BN030634.0000

Date:
April 5, 2013

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1. Introduction

ARCADIS U.S., Inc. (ARCADIS) was retained by Cape Cod Community College (CCCC) to prepare this Risk Based Disposal and Cleanup Plan (the Plan) as part of planned renovations at the Wilkins Library for the Nickerson Cape Cod History Archives. The investigation presented in this report was conducted by ARCADIS on behalf of and for the exclusive use of CCCC and is subject to the Limitations and Service Constraints presented in Appendix A.

2. Site Description

The Wilken's Library is a multi-level, brick building constructed in the late 1960's. The structure is located on the southern portion of the CCCC campus and has been occupied as the Library since construction. A Site Location Map is included as Figure 1, and a Campus Map is included as Figure 2.

The planned renovation area includes three offices, four storage rooms, and a computer server room in the basement of the Wilkins Library. The basement is a split-level structure, the offices (LG13, LG14, and LG15) are located on the main basement level along with storage room LG11. Storage room LG12 (divided into three small storage rooms) and the server room are located in the sub-level of the basement. Offices LG13, LG14, and LG15 face a walk-out level concrete patio accessed through a door in LG15. The offices have floor-to-ceiling windows facing the patio, which are metal framed and anchored into concrete columns and the slab. The window in LG15 is anchored to a concrete lintel, and the windows in LG13 and LG14 are anchored into a metal frame. The planned renovation area is depicted in Figure 3.

Interior walls within the path of construction are constructed of concrete masonry unit (CMU) or drywall. Flooring is carpet or tile over poured concrete. Interior door and window frames are constructed of metal. Photographs depicting pertinent site features and sampling locations are included in Appendix B.

3. Site Characterization

3.1 Building Materials Inventory

ARCADIS observed suspect PCB-containing building materials at 16 locations within the path of construction. The locations were numbered 1 through 16 for the purpose of inventorying the material at each location. Table 1 presents an inventory of the types of suspect PCB-containing material by location. Table 2 details approximate linear footage (lf) of the source materials contacting porous substrate. Figure 1 depicts the numbered locations, the approximate limits of the planned renovation areas, and the interior sample locations. Exterior sample locations are shown on Figure 2.

Actually Figs. 3+4

ARCADIS identified the following materials suspected to contain PCBs:

- Brown caulking: Approximately 382 lf of material observed. Observed around interior windows and door frames contacting interior concrete masonry unit (CMU) walls. Observed around exterior windows and door frames (interior side only) in LG15 contacting concrete columns and concrete lintel.
- Black caulking: Approximately 164 lf of material observed. Observed around exterior windows and door frames contacting concrete or brick.
- Yellow caulking: Approximately 9 lf of material observed. Observed in a seam in the CMU in LG15.
- Light (Lt.) gray glazing: Approximately 526 lf of material observed. Observed on interior and exterior window frames and the exterior door frame throughout the path of construction (the exterior glazing was identified as white by prior consultants, but ARCADIS compared the interior and exterior glazing and determined that they are the same material).
- Black rubber glazing: Approximately 36 lf of material observed. Observed around three exterior window panes.
- Exterior expansion joint material: Approximately 45 lf of material observed. Non pliable black sealant observed in the expansion joint between the exterior concrete window sill and the exterior concrete patio. Referred to as "expansion joint material" throughout the rest of the text.

3.1.1 Summary of Sampling Conducted

Sampling events were conducted at the Site by Fuss & O'Neill Envrioscience, LLC (Fuss & O'Neill) in April 2011 and June 2011. ARCADIS conducted supplemental sampling events at the Site in May 2012, September 2012, and January 2013.

Fuss & O'Neill collected samples of suspect PCB-containing material (caulking and glazing) and substrate (concrete and brick). Fuss & O'Neill reported using disposable hand tools to collect bulk product material samples. Fuss & O'Neill reported that substrate samples were collected "using procedures modeled after [U.S. Environmental Protection Agency (EPA)] Guidance for field sampling of concrete". Samples were analyzed using EPA Method 8082 with Soxhlet Extraction EPA Method 3500B/3540C.

Sampling events conducted by ARCADIS included sample collection of suspect PCB-containing materials and substrate. Bulk product materials (or "source materials") were sampled using disposable hand tools. Substrate samples were collected in accordance with the May 2011 EPA Region I *Draft Standard Operating Procedure for Sampling Concrete in the Field* (EPA SOP). The hammer drill and bits used for substrate sampling were decontaminated with hexane between sample locations using a hexane rinse, a deionized water rinse, an anionic washing detergent/water rinse, and a second deionized water rinse.

All samples were logged on a standard Chain-of-Custody (COC) and stored on ice for delivery to the analytical laboratories. Samples were analyzed via EPA Method 8082 with Soxhlet Extraction.

3.1.2 Laboratory Analytical Results

Samples collected by Fuss & O'Neill in April 2011 were analyzed by Phoenix Environmental Laboratories, Inc of Manchester, Connecticut. Samples collected by Fuss & O'Neill during the June 2011 event were analyzed by ConTest Analytical Laboratory (ConTest) of East Long Meadow, Massachusetts.

Samples collected by ARCADIS in May 2012, September 2012, and January 2013 were analyzed by ConTest. Field split samples from the three sampling events were analyzed by Alpha Analytical of Westborough, Massachusetts.

Laboratory analytical data sheets and data validations are included in Appendix C and D, respectively. Analytical results are summarized in Table 3 (Source Material Data), Table 4 (Substrate Data), Table 5 (Equipment Blank Data), Table 6 (Field Duplicate Samples), and Table 7 (Field Split Samples).

3.1.3 Data Usability Assessment

A data quality assessment was conducted to evaluate the usability of the data generated in support of the Site characterization.

3.1.3.1 Equipment Blanks

Five equipment blanks were submitted for laboratory analysis. The equipment blanks were collected by pouring hexane over decontaminated sample tools. The hexane was collected, containerized and submitted for PCB analysis. No PCBs were detected in the equipment blanks. Table 5 summarizes equipment blank analytical results and samples collected immediately before and after the equipment blanks.

3.1.3.2 Duplicate and Field Split Samples

ARCADIS collected five duplicate samples and five field split samples. Samples were collected as described in the EPA SOP.

Reproducibility was evaluated by calculating the relative percent difference (RPD) between the original and duplicate samples. The RPD is calculated as follows:

$$RPD = 100 \times \frac{|X_2 - X_1|}{\frac{X_2 + X_1}{2}}$$

where:

X_1 and X_2 are the two observed values

The RPD calculations are presented in Table 6 and Table 7. In general, the RPD is more consistent among substrate samples compared to the bulk material samples for both the duplicates and the field split samples. The RPD between bulk samples and duplicates or split samples is significant, indicating a high level of variability in PCB concentration in bulk materials.

The RPD reported for the duplicate substrate samples (three total) were reported within allowable limits (less than 50%).

3.1.3.3 Data Validation

A modified Tier II validation was performed on the analytical results and the reports are included as Appendix D. The data validation indicated that the data was usable except for a qualification of sample Caulk-Brown-4, which was extracted 8 days after sampling and the extraction holding time was 7 days. It was analyzed within the 40-day holding time. There were some samples where the relative percent difference did not meet acceptance criteria, so these data were qualified.

4. Results of Site Characterization

4.1 Bulk Material Sample Analytical Results

4.1.1 Brown Caulking

A total of 16 primary samples of the interior brown caulking were collected and analyzed for PCBs. Three samples were collected by Fuss & O'Neill, and 13 samples were collected by ARCADIS. At least one sample was collected from every door or window frame within the path of construction that is sealed with this material. PCBs were detected in 3 of the 16 samples at concentrations greater than 50 parts per million (ppm). The brown caulking will be managed as PCB Bulk Product Waste.

4.1.2 Black Exterior Window Caulking

Four primary samples of exterior black window caulking were collected. The black caulking is located around the exterior window bank. The caulking was observed around the four sides of the exterior window in LG15. The caulking was observed along the bottom and two vertical sides of the windows in LG13 and LG14. The top of the windows in LG13 and LG14 was not sealed with caulking as it is attached to a metal frame. PCBs were detected at concentrations ranging from 120,000 ppm to 230,000 ppm in the samples. The black caulking will be managed as PCB Bulk Product Waste.

4.1.3 Yellow Caulking

Three samples of yellow caulk were analyzed for PCBs. The yellow caulk was observed in one location in office LG15. PCBs were detected in the three samples of this material at concentrations ranging from 2.5 ppm to 4.4 ppm.

4.1.4 Light Gray Window Glazing

Nine samples of the interior and exterior window glazing were collected for PCB analysis. PCBs were detected at concentrations ranging from 2.1 ppm to 6.5 ppm in the nine samples analyzed.

4.1.5 Black Rubber Window Glazing

The black rubber window glazing was observed around three exterior window panes. Three samples of this material (one from each window pane) were analyzed for PCBs. PCBs were detected at concentrations ranging from 7.1 ppm to 22 ppm in the three samples.

4.1.6 Exterior Expansion Joint Material

ARCADIS collected three samples of the exterior expansion joint material between the exterior concrete sill and the patio (identified as EJ-1, EJ-2, and EJ-3). PCBs were detected in each of the three samples at concentrations ranging from 39 ppm to 46 ppm.

Laboratory analytical results for the bulk material samples are presented in Table 3. A summary of laboratory analytical results is presented here:

Material Sampled	Number of Samples		PCB Concentration Range (ppm)	Number of Samples Exceeding 50 ppm
	By ARCADIS	Total		
Brown Caulking	13	16	ND - 1,100	3
Black Caulking	3	4	120,000 - 230,000	4
Yellow Caulking	3	3	2.5 – 4.4	0
Lt. Gray Glazing (Interior & Exterior)	3	9	ND - 6.5	0
Black Window Glazing	3	3	7.1 - 22	0
Exterior Expansion Joint Material	3	3	39 - 46	0

Laboratory analytical data sheets for the samples submitted by ARCADIS are included in Appendix C.

4.2 Adjacent Substrate Characterization

The adjacent substrate contacting bulk materials described above were sampled for PCBs analysis. Substrate sampled included brick, concrete, and CMU. The light gray glazing and the black window glazing were not observed to contact porous surfaces. Substrate samples were collected from locations adjacent to suspect source materials, and subsequent step-out samples were collected as necessary. Adjacent to means as close to the source materials as possible, without risking cross contamination of substrate samples. Using equipment and methodologies specified in the EPA SOP, samples were generally collected within 0.5 inch of the source material. However, at sample locations where access was limited (i.e., up against a wall or window frame) samples were collected from as close to the source material as possible, which was typically within 1 inch of the source material.

Substrate samples were collected in half-inch depth intervals in accordance with the EPA SOP. Surficial samples are described as the 0-0.5- inch interval. Substrate sample analytical results are summarized in Table 3 and are compared to the EPA Unrestricted Use Cleanup Standard of 1 ppm. Porous substrate sample analytical results are described in the following sections.

4.2.1 Exterior Brick Window Jamb

Approximately 9 lf of exterior brick window jamb located outside office LG13 is contacted by the black exterior window caulk. Fuss & O'Neill collected one sample of the brick adjacent to the black caulking, which exhibited a PCB concentration of 1.5 ppm. ARCADIS collected six additional samples of the brick. Two samples were collected from discrete depth intervals (0-0.5 inch and 0.5-1 inch) at three locations adjacent to the black caulk. PCBs were not detected above 1 ppm in the samples collected by ARCADIS.

4.2.2 Concrete Lintels

A concrete lintel is located above the exterior window in LG15. The concrete lintel is contacted on the exterior by the black exterior window caulk and on the interior by the brown caulk. ARCADIS collected four samples of the concrete lintel, two samples from the exterior side and two samples from the interior side. The samples were collected

from the bottom face of the lintel adjacent to the source material. Two depth intervals (0-0.5 inch and 0.5-1 inch) were sampled at both locations. PCBs were not detected above 1 ppm in the concrete lintel samples.

4.2.3 Concrete Masonry Unit Walls

Interior CMU walls were contacted in multiple locations by the brown caulking and in one location by the yellow caulking. Samples were collected from three locations adjacent to the brown caulking (CMU-1, CMU-2, and CMU-3) and from one location (CMU-4) adjacent to the yellow caulking. Two intervals (0-0.5 inch and 0.5-1 inch) were sampled at the four CMU sample locations.

PCBs were not detected above 1 ppm in any of the CMU samples analyzed. Sample CMU-3 was located adjacent to the brown caulk sample 609-JH-B-03, which exhibited a PCB concentration of 84 ppm. Two other brown caulk samples exhibited higher PCB concentrations but did not contact CMU.

4.2.4 Concrete Columns

Four surficial concrete samples were collected from the concrete columns. The columns are load-bearing and cannot be removed without compromising the integrity of the structure. The concrete columns are contacted by black caulking and brown interior caulking. The three samples collected adjacent to the black caulking (609-JH-C-02A, -02B, and -02C) exhibited PCB concentrations ranging from 3.6 ppm to 19 ppm. Sample Concrete-13-0-0.5 inch, collected adjacent to the brown caulking of the interior window in LG13, did not exhibit PCBs in excess of 1 ppm.

4.2.5 Concrete Window Sill

The exterior concrete window sill is contacted by the black exterior caulking. Five surficial samples of the sill were collected adjacent to the black caulking from the horizontal face of the sill downward. Three surficial samples were collected by Fuss & O'Neill (609-JH-C-01A, -01B, and -01C) and two were collected by ARCADIS (Concrete-3A and Concrete-4A). PCBs were detected above 1 ppm in 4 of the 5 surficial samples analyzed.

ARCADIS collected three deeper samples from the sill at locations Concrete-3 and Concrete-4. A total of four discrete half-inch intervals were sampled at both locations. PCBs were detected above 1 ppm in three of the four samples collected from location

Concrete-3. The concentration reported for sample interval Concrete-3C-1-1.5- inch was 0.93 ppm. The reported concentration for sample interval Concrete-3D-1.5-2- inch was 1.09 ppm. PCBs were detected at concentrations greater than 1 ppm in the top three sample intervals at location Concrete-4. PCBs were detected in sample Concrete-4D-1.5-2 inch at a concentration of 0.78 ppm.

4.2.6 Concrete Floor

The interior concrete floor is slab-on-grade and is contacted by the black caulking beneath the window frames. The floor and the sill described in Section 4.2.5 are the same concrete pour, but distinguished between interior and exterior spaces. The cross sections presented in Figure 5 depict the construction details of the floor.

A total of 14 samples of the concrete floor were collected from 8 locations. Samples were collected from adjacent to the window frames (3 locations, 2 sample intervals per location), 6 inches from the window frames (3 locations, 2 sample intervals per location), and 2 feet from the window frames (2 locations, surficial samples only).

Sample locations Concrete-7, Concrete-9, and Concrete-11 are located adjacent to from the window frames. PCBs were detected in both sample intervals (0-0.5 inch and 0.5-1 inch) at concentrations above 1 ppm at these 3 locations.

Sample locations Concrete-8, Concrete-10 and Concrete-12 are located 6 inches from the window frames. PCBs were detected above 1 ppm in both samples intervals from Concrete-12 and from the surficial sample interval at location Concrete-8. PCBs were detected at concentrations below 1 ppm in the 0.5-1 inch interval at Concrete-8. PCBs were detected below 1 ppm in sample Concrete-10A-0-0.5 inch, and were not detected above laboratory method detection limits (MDLs) in sample Concrete-10B-0.5-1 inch.

PCBs were not detected above 1 ppm in the surficial samples from Concrete-16 (less than MDLs) or Concrete-18 (0.17 ppm), located 2 feet from window frame.

4.2.7 Exterior Concrete Patio

The exterior concrete patio abuts the window sill described in Section 4.2.5 but is not continuous concrete. The two slabs are divided by the expansion joint, which is filled with the expansion joint material. Seven locations were sampled, 5 sample locations were adjacent to the expansion joint, and 2 sample locations were located approximately 6 inches from the expansion joint.

PCBs were detected at concentrations greater than 1 ppm in 2 of 5 surficial samples of the patio adjacent to the expansion joint. Samples Concrete-6A-0-0.5 inch and Concrete-5A-0-0.5 inch exhibited PCB concentrations of 1.2 ppm and 1.18 ppm, respectively. PCBs were not detected above 1 ppm in the samples collected from the 0.5-1 inch intervals at these locations.

PCBs were not detected above 1 ppm in the surficial samples located 6 inches from the expansion joint (locations Concrete-1 and Concrete-2). PCBs were not detected above laboratory MDLs in the 0.5-1 inch sample intervals at these two sample locations.

5. Conceptual Site Model

This Conceptual Site Model (CSM) has been developed based on the laboratory analytical testing described above. Based on the findings of the investigations conducted at the Site, there are two types of *PCB bulk product waste* within the path of construction as defined by 40 CFR 761.3: the black exterior window caulking and the brown interior window and door caulking.

Substrate sampling adjacent to the brown caulking has not indicated PCB contamination in excess of 1 ppm. Substrate sampling adjacent to the black caulking has indicated PCB contamination in excess of 1 ppm in various building materials. The limits of the PCB contamination greater than 1 ppm are described below.

Exterior Brick: PCB contamination greater than 1 ppm is limited to the course of bricks directly contacting the black caulking. The bricks are a 1-inch thick façade, and there is a void behind them.

Concrete Columns: It was not possible to fully characterize the columns due to the risks of the integrity of the building structure. For the purposes of this Risk-Based Plan, it will be conservatively assumed that the surfaces of the columns are entirely contaminated with PCBs greater than 1 ppm.

Concrete Window Sill: The concrete window sill extends approximately 3.5 inches beyond the window frame where the black caulking is located. PCB contamination greater than 1 ppm extends horizontally to the limit of the sill, and PCB contamination greater than 1 ppm extends vertically at least 2 inches into the concrete.

Interior Concrete Floor: PCB contamination greater than 1 ppm extends approximately 6 inches laterally into office LG14, and 2 feet laterally into offices LG13 and LG15.

Exterior Concrete Patio: PCB contamination greater than 1 ppm extends laterally 6 inches onto the patio. PCB contamination is limited to the surficial half-inch of concrete.

For the purposes of characterizing the patio and the interior floor, samples were collected adjacent to the bulk material, and then step-out samples were collected. The limits of PCB contamination greater than 1 ppm are described as the step-out sample(s) nearest the bulk material with concentration less than 1 ppm.

6. Remediation Plan

6.1 General Overview of Proposed Remediation

The remediation plan for the Site has been developed to accomplish the following objectives:

- Remove and dispose of PCB Bulk Product Waste in accordance with 40 CFR 761.62;
- Encapsulation of PCB-contaminated building materials for which removal is infeasible;
- Recording a deed notice for the encapsulation remedial approach; and
- Long term monitoring of the encapsulated surfaces.

This risk-based remediation plan has been developed for bulk product waste and contaminated substrate removal and follows the general approach that would be utilized for addressing spills and releases of PCBs in conformance with the requirements of 40 CFR 761.61(a) *Self-Implementing on-Site Cleanup and Disposal.* Contaminated substrate will be managed as PCB-bulk product waste in accordance with the proposed reinterpretation of the Toxic Substances Control Act (TSCA) regulations.

This remediation plan also follows the approach for encapsulating contaminated substrate in accordance with the requirements of 40 CFR 761.30(p) *Continued use of porous surfaces contaminated with PCBs regulated for disposal by spills of liquid*

PCBs. However, since the bulk product (caulking) is considered a manufactured product and not a liquid PCB, this remediation plan is being submitted for EPA approval per 40 CFR 761.61(c) *Risk-based disposal approval*. Details of the steps to accomplish the objectives outlined above are provided in the following sections.

6.2 Site Preparation and Controls

6.2.1 Health and Safety Plan

A Site-specific health and safety plan will be developed prior to initiating the work. The plan will be strictly adhered to and implemented by Site workers, CCCC personnel and visitors. The plan will address (but is not limited to) state and federal regulations including personal protective equipment (PPE), personnel qualification requirements, and the Occupational Safety and Health Administration (OSHA) requirements.

6.2.2 Work Area Containment

An isolated containment zone will be established around the work area, which includes interior and exterior areas. Access to the work area will be controlled by the contractor to ensure only authorized personnel enter the containment. The work area will be sealed with polyethylene sheeting and properly vented with high efficiency particulate air (HEPA) filtration. This containment will be maintained to control odors from the encapsulation process. A worker decontamination zone will be established adjacent to the containment access point.

6.2.3 Air and Dust Monitoring

Dust monitoring will be conducted outside the containment zone during removal of caulking and building materials. Dust levels will be minimized by using tools with dust/debris collection systems and wetting materials prior to removal. The containment zone and HEPA filtration within the work zone enclosures will further reduce dust levels. Workers within the enclosures will be required to use respirators, tyvek suits, and other appropriate PPE to limit exposure.

6.3 PCB Bulk Product Removal

The brown caulking and black caulking are *PCB bulk product waste* as defined in 40 CFR 761.3 and will be disposed of in accordance with CFR 761.62. The yellow caulk is not PCB bulk product waste as defined in 40 CFR 761.3, but will be managed as *PCBbulk product waste* for this removal action.

The process for removing the caulking is as follows:

- The material will be wetted to minimize dust, as described above.
- Caulking will be removed from the joints using machinery and hand tools. A volume estimate for the caulking to be removed is approximately 3 cubic feet for the approximately 600 linear feet of caulking.
- Upon completion of caulking removal, the joints will be inspected and residual caulking will be removed. Bricks along the exterior façade in direct contact with the black caulking will be removed along with the black caulking and will be managed as *PCB bulk product waste* in accordance with the proposed reinterpretation of the TSCA regulations.
- Less than 1 cubic foot of brick will be removed along with the black caulking.

The Expansion Joint Material is not *PCB bulk product waste* as defined in 40 CFR 761.3 because PCB concentrations in the samples were less than 50 ppm, but will be managed as *PCB bulk product waste* for this removal action due to the concentrations ranging from 39 to 46 ppm. The Expansion Joint Material will be removed as follows:

- The material will be wetted to minimize dust, as described above.
- The exterior concrete patio will be saw-cut 6 inches from the expansion joint, to a depth of 8 inches, which is the thickness of the patio. The cut will extend 6 inches beyond the exterior window at LG-13 and to the perpendicular sill on the other end.
- The 6-inch wide portion of the patio and the attached expansion joint will then be removed and managed as *PCB bulk product waste*. Approximately 15 cubic feet of co-mingled concrete and expansion joint material will be generated during this removal. The concrete to be removed is depicted in Figure 6.

likely still shift independently of the rest of the floor and likely crack at the surface. Additionally, abating the floor would likely cause long-term problems (floor cracking or flooring bubbling) to the final renovated area, which undermines the aesthetics of the renovated space. Thus, concrete floor/sill removal is considered infeasible due to structural concerns related to replacement flooring in the area.

Therefore, the concrete columns and floor/sill will remain in place and will be encapsulated with Sikagard 550W, or an equivalent elastomeric water based acrylic coating. The encapsulation will consist of two coats of contrasting color.

The encapsulation will be completed on the columns first. Exposed faces of the column will be encapsulated. The planned exterior wall where the window bank is currently located will then be constructed. The encapsulant will then be applied to the interior floor a minimum of 3 feet into the building, 3 feet beyond the former window frames, and up the interior wall a minimum distance of 2 inches. The encapsulant will then be applied to the exterior concrete sill on the horizontal and vertical faces.

The encapsulant will be extended a minimum of 2 inches up the exterior wall, and a minimum of 2 inches below the level of the removed expansion joint material. The concrete patio will then be repaired. A cross section depicting concrete removal and encapsulation is presented in Figure 6.

The technical specification sheet for Sikagard 550W is included in Appendix E. Successful application of the encapsulant is highly dependent on proper surface preparation including removing interfering materials (other paint, oil, dirt), scoring the surfaces to ensure proper bond, selecting the proper encapsulant, and implementing a monitoring plan.

Upon completing the encapsulation, baseline verification wipe samples will be collected to evaluate the effectiveness. Wipe samples will be collected from the encapsulated columns, the exterior window sill, and the interior floor at the following frequencies:

- 1 wipe sample per column (approximately 1 foot x 1 foot x 9 feet), for a total of four wipe samples at a frequency of one per 36 square feet.

- 2 wipe samples will be collected from the exterior concrete sill. The area of the encapsulated sill will be less than 1 foot by approximately 40 feet. Wipe sample frequency of the sill will be 1 per 20 square feet.

- 3 wipe samples will be collected from the encapsulated floor, which will be an area 45 feet long by 3 feet wide or 135 square feet. The sample wipe frequency of the encapsulated floor will be one per 45 square feet.

Encapsulation will be considered complete when all wipe samples indicate surficial PCB concentrations below 10 micrograms per 100 square centimeters (µg/100 cm^2). If wipe samples exhibit PCB concentrations exceeding this threshold, additional layers of encapsulant will be applied, and the area will be re-sampled until PCBs are not detected above 100 µg/100 cm^2.

Additionally, ARCADIS will collect three wipe samples from outside the path of construction to verify that abatement activities did not contaminate other indoor environments. One wipe sample will be collected from the patio, one from the current hallway area outside the path of construction, and one sample will be collected from the wall adjacent to the loading dock entrance.

Spoke w/ Brad Batchelder 4/30/13 to clarify required level for encapsulated surfaces. WTSL

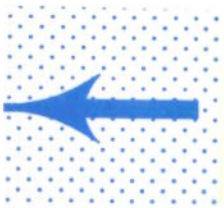
6.6 Storage and Disposal

Bulk materials removed from the construction area will be managed as PCB Bulk Product Waste in accordance with 40 CFR 761.62. The PCB-contaminated concrete, brick, and framing will be removed and managed as PCB Bulk Product Waste in accordance with the reinterpretation of the TSCA regulations.

Removed building materials will be wrapped in polyethylene sheeting inside the containment areas prior to transport to lined roll-off containers (or equivalent). The roll-off containers will be department of transportation (DOT) compliant and will be staged in a secure area pursuant to 40 CFR 761.65. Waste containers will be properly labeled in accordance with 40 CFR 761.40.

Decontamination fluids and rinses will be containerized in DOT compliant 55-gallon drums for off-Site disposal. At the completion of the project, containerized decontaminated fluids will be profiled for off-Site treatment options. If off-Site treatment is not an option due to PCB concentration in the liquids, the liquids will be transported to an incinerator facility in accordance with § 761.60.

Roll-off containers will be transported under manifest for off-Site disposal to a TSCA-permitted landfill permitted to accept the waste containing PCBs and asbestos. Drums containing PCB-contaminated liquids will be transported under manifest to an approved treatment facility.



Completed waste disposal manifests will be included in the completion report submitted to EPA at the completion of the project.

6.7 Long Term Monitoring Plan

Long-term monitoring of the encapsulated concrete surfaces is necessary to verify that exposure pathways are eliminated by the remedy. A maintenance and monitoring plan (MMP) will be prepared at the completion of the project and will detail long-term monitoring requirements, which are summarized below:

- Visual inspections of encapsulated surfaces will be conducted quarterly. The inspections will be focused on exposed surfaces. The inspection will look for weak areas in the encapsulant, such as evidence of wearing, chips, or cracks.

- Wipe sampling of the encapsulated surfaces will be conducted annually. Wipe samples will be collected from one column, one location along the exterior sill, and two locations along the interior floor. The sample locations will be selected based on evidence of weak areas described above. If no suspect weak areas in the encapsulant are identified, sample locations will be selected randomly. Wipe sampling will be conducted in accordance with the requirements of 40 CFR 761.123.

- A benchmark indoor air sampling event will be conducted after remediation and prior to encapsulation. Indoor air sampling will be conducted after encapsulation, and then quarterly for one year. Two indoor air samples and one outdoor air sample will be collected in the air sampling events. If PCBs are not detected in indoor air before encapsulation, after encapsulation, or in the four quarterly monitoring events, subsequent indoor air sampling will not be conducted.

- Annual reports documenting the findings of the inspections and sampling will be submitted to EPA. The report will include a summary of corrective actions required (if any) and proposed frequency of inspections for the following year.

- The MMP will provide guidelines for personnel and maintenance to the building within the project area. It will describe the communications plan for maintenance workers, worker protection requirements, and worker training requirements for work that may affect the encapsulated PCB-contaminated concrete.

6.8 Recordkeeping and Documentation

At the completion of the project, documents and records pertaining to the project will be compiled and maintained at a designated location at the College. The documents will include the completion report, which will detail removal activities, encapsulation activities, and verification sampling results. The completion report will also include disposal documentation detailing the volume and destination of waste generated as part of the project.

A deed restriction will be filed for the Site, detailing the extent of PCBs in concrete in excess of allowable cleanup levels. The deed restriction will remain on the Site until the PCB-contaminated material can be removed.

6.9 Owner Certification

A written certification, conforming to the requirements of 40 CFR 761.61(a)(3)(i)(E) has been signed by the owner of the property (who is also conducting the cleanup) and is provided in Appendix F.

7. Schedule

Renovation work will be completed by June 1, 2013 in accordance with CCCC project specifications. The PCB removal and encapsulation is expected to take approximately two weeks to complete.

ARCADIS

TABLES

Table 1- Inventory of Bulk Materials Sampled
Cape Cod Community College
West Barnstable, Massachusetts

Material Location Identification Number	Location	Location Type	Material Type	Color	Linear Footage
1	LG15	Interior door with window	***Caulking***	***Brown***	***46***
			Glazing	*Lt. Gray*	*20*
2	LG15	Closet door	***Caulking***	***Brown***	***21***
3	LG15/LG14	Interior door between offices	***Caulking***	***Brown***	***42***
4	LG15	Exterior window	***Caulking***	***Brown***	***24***
			Caulking	**Black**	**36**
			Glazing	*Lt. Gray*	*180**
5	LG15	Exterior double door	***Caulking***	***Brown***	***9***
			Caulking	**Black**	**9**
			Glazing	*Lt. Gray*	*112**
6	LG14	Exterior window	**Caulking**	**Black**	**88**
			Glazing	*Lt. Gray*	*100*
			Glazing	Black Rubber	36
7	LG13	Exterior window	**Caulking**	**Black**	**36**
			Glazing	*Lt. Gray*	*84*
8	LG14	Interior door	***Caulking***	***Brown***	***42***
9	LG14/LG15	Joint between window frame and interior CMU wall	***Caulking***	***Brown***	***18***
10	LG13	Interior door	***Caulking***	***Brown***	***42***
11	LG13/LG11	Interior window	***Caulking***	***Brown***	***50***
			Glazing	*Lt. Gray*	*30*
12	LG12	Interior door	***Caulking***	***Brown***	***46***
13	LG11	Interior door	***Caulking***	***Brown***	***42***
14	LG11	Interior door		NA	
15	LG15	CMU seam	Caulking	Yellow	9
16	Exterior	Expansion Joint	Caulking	Black	40

Notes:
1. Material Location Indentification Numbers assigned by ARCADIS during field investigation. Refer to Figure 1 for ID locations
2. NA = Not observed at that location
3. * = Glazing on interior and exterior sides of window
4. **Bold** = PCB Concentration > 50 ppm
5. Italics= Confirmed ACM
6. Refer to Table 3 for full analytical results

Table 2- Summary of Substrate Sampling Frequency by Source Material
Cape Cod Community College
West Barnstable, Massachusetts

Source Material	Total LF of Source Material	Sustrate	Location		LF of Porous Subsrate Contacted By Source Material	Total # Samples	Total # Sample Locations
Brown Caulk	382	CMU	Adjacent	3 sample locations, 2 depth intervals each	180****	6	3
		Concrete Columns	Adjacent	1 sample location, 1 depth interval	30	1	1
		Interior Lintel	Adjacent	1 sample location, 2 depth intervals	8	2	1
Black Caulk	164	Sill	Adjacent	2 locations 4 depth intervals		8	2
			Adjacent	3 locations 1 depth interval		3	3
			Sill Sample Subtotal		37*	**11**	**5**
		Interior Floor	Adjacent	3 sample locations, 2 depth intervals each		6	3
			6"	3 sample locations, 2 depth intervals each		6	3
			24"	2 sample locations, 1 depth interval each		2	2
			Interior Floor Subtotal		37*	**14**	**8**
		Patio	Adjacent	2 sample locations, 2 depth intervals each		4	2
			6"	2 sample locations, 2 depth intervals each		4	2
			Patio Subtotal		37*	**8**	**4**
		Exterior Lintel	Adjacent	1 sample location, 2 depth intervals	9	2	1
		Concrete Columns	Adjacent	3 sample locations, 1 depth interval each	45	3	3
		Concrete Total			**91**	**38**	**21**
		Brick	Adjacent	3 sample location, 2 depth intervals each		6	3
			Adjacent	1 sample location, 1 depth interval	9	1	1
		Brick Total			**9**	**7**	**4**
Yellow Caulk	9	CMU	Adjacent	1 sample location, 2 depth intervals	9	2	1
Expansion Joint Material	45	Patio	Adjacent	2 sample locations, 2 depth intervals each		4	2
			6"	2 sample locations, 2 depth intervals each		4	2
			Patio Subtotal		45**	**8*****	**4*****
		Sill	Adjacent	2 locations 4 depth intervals	45**	8***	2***
		ConcreteTotal			90**	16***	6***

Notes:
1. * = The black caulk seam below the exterior window bank is 37 LF. Samples associated with that source material include the sill, patio, and interior floor. The total LF of the black caulk contacting concrete counts the 37 LF seam 1 time
2. ** = The expansion joint material is ocated between the patio and the sill. It contacts 45 LF of each substrate, therefore total LF of concrete substrate associated with the expansion joint is 90 LF
3. *** = The samples associated with the expansion joint are also associated with the black caulking due to proximity and should not be double counted.
4. ****= Brown caulking was observed on both sides of some interior frames. A door frame of 21 LF may have 42 LF brown caulk contacting 21 LF of CMU.
5. Total LF of Black Caulk is more than LF contacting porous substrate because some of that material is contacting frames only.

Table 3-
Summary of Laboratory Analytical Results- Source Material
Cape Cod Community College
West Barnstable, Massachusetts

Sample Material	Sample ID	Sampled By	Sampling Date	PCB 1232	PCB 1248	PCB 1254	PCB 1268	Total PCBs	PCB Bulk Product Waste Threshold
Brown Caulk	Caulk-Brown-1	ARCADIS	5/16/2012	ND (9.7)	46	ND (9.7)	ND (9.7)	46	50
		ARCADIS	5/16/2012	ND (0.89)	3.7	3.1	ND (0.89)	6.8	50
	Caulk-Brown-2	ARCADIS	5/16/2012	ND (0.84)	ND (0.84)	8.7	ND (0.84)	8.7	50
	Caulk-Brown-3	ARCADIS	5/16/2012	ND (0.87)	4.4	3.2	ND (0.87)	7.6	50
	Caulk-Brown-4	ARCADIS	9/6/2012	ND (0.76)	2	ND (0.76)	ND (0.76)	2.0	50
	Caulk-Brown-5	ARCADIS	9/10/2012	ND (0.68)	2.2	ND (0.68)	ND (0.68)	2.2	50
	Caulk-Brown-5 Split	ARCADIS	9/10/2012	ND (0.25)	ND (0.17)	1.06	0.546	1.6	50
	Caulk-Brown-6	ARCADIS	9/10/2012	ND (0.70)	1.5	ND (0.70)	ND (0.70)	1.5	50
	Caulk-Brown-7	ARCADIS	9/10/2012	ND (0.69)	2.4	2.9	ND (0.69)	5.3	50
	Caulk-Brown-8	ARCADIS	9/10/2012	ND (0.76)	1.5	ND (0.76)	ND (0.76)	1.5	50
	Caulk-Brown-9	ARCADIS	9/10/2012	ND (0.72)	1.8	ND (0.72)	ND (0.72)	1.8	50
	Caulk-Brown-10	ARCADIS	9/10/2012	ND (8.9)	**110**	ND (8.9)	ND (8.9)	**110**	50
	Caulk-Brown-11	ARCADIS	9/10/2012	ND (0.70)	1.3	ND (0.70)	ND (0.70)	1.3	50
	Caulk-Brown-12	ARCADIS	9/10/2012	ND (0.74)	1.3	ND (0.74)	ND (0.74)	1.3	50
		ARCADIS	9/10/2012	2.4	ND (0.71)	ND (0.71)	ND (0.71)	2.4	50
	Caulk-Brown-13	ARCADIS	9/10/2012	ND (37)	**1,100**	ND (37)	ND (37)	**1,100**	50
	035DD-PCB-04	Enviroscience	3/25/2011	ND (4.1)	ND (4.1)	23	ND (4.1)	ND	50
	035DD-PCB-05	Enviroscience	3/25/2011	ND (4.1)	ND (4.1)	16	ND (4.1)	16	50
	609-JH-B-03	Enviroscience	6/9/2011	ND (9.5)	**84**	ND (9.5)	ND (9.5)	**84**	50
Black Caulk	Caulk-Black-1	ARCADIS	5/16/2012	ND (9,700)	ND (9,700)	**130,000**	ND (9,700)	**130,000**	50
	Caulk-Black-2	ARCADIS	5/16/2012	ND (9,300)	ND (9,300)	**140,000**	ND (9,300)	**140,000**	50
	Caulk-Black-3	ARCADIS	5/16/2012	ND (9,500)	ND (9,500)	**120,000**	ND (9,500)	**120,000**	50
	Caulk-Black-3 Split	ARCADIS	5/16/2012	ND (361)	ND (241)	**7,730**	ND (120)	**7,730**	50
	035DD-PCB-02	Enviroscience	3/25/2011	ND (40,000)	ND (40,000)	**230,000**	ND (40,000)	**230,000**	50
Lt. Gray Glazing (Interior & Exterior)	Glazing-LT. Gray-1	ARCADIS	5/16/2012	ND (0.93)	ND (0.93)	6.5	ND (0.93)	6.5	50
	Glazing-LT. Gray-2	ARCADIS	5/16/2012	ND (0.93)	ND (0.93)	5.5	ND (0.93)	5.5	50
	Glazing-LT. Gray-3	ARCADIS	5/16/2012	ND (0.97)	ND (0.97)	5.7	ND (0.97)	5.7	50
	035DD-PCB-01	Enviroscience	3/25/2011	ND (0.81)	ND (0.81)	6.1	ND (0.81)	6.1	50
	035DD-PCB-03	Enviroscience	3/25/2011	ND (0.83)	ND (0.83)	5.1	ND (0.83)	5.1	50
	609-JH-B-01A	Enviroscience	6/9/2011	ND (0.86)	ND (0.86)	2.9	ND (0.86)	2.9	50
	609-JH-B-01B	Enviroscience	6/9/2011	ND (0.88)	ND (0.88)	2.1	ND (0.88)	2.1	50
	609-JH-B-02A	Enviroscience	6/9/2011	ND (0.94)	ND (0.94)	5.3	ND (0.94)	5.3	50
	609-JH-B-02B	Enviroscience	6/9/2011	ND (0.88)	ND (0.88)	5.4	ND (0.88)	5.4	50
Black Window Glazing	Glazing-Black-1	ARCADIS	5/18/2012	ND (3.9)	ND (3.9)	22	ND (3.9)	22	50
	Glazing-Black-2	ARCADIS	5/18/2012	ND (0.98)	ND (0.98)	13	ND (0.98)	13	50
	Glazing-Black-3	ARCADIS	5/18/2012	ND (0.91)	ND (0.91)	7.1	ND (0.91)	7.1	50
Yellow Caulk	Caulk-Yellow-1	ARCADIS	9/10/2012	ND (0.77)	2.7	ND (0.77)	ND (0.77)	2.7	50
	Caulk-Yellow-2	ARCADIS	9/10/2012	ND (0.75)	2.5	ND (0.75)	ND (0.75)	2.5	50
	Caulk-Yellow-3	ARCADIS	9/10/2012	ND (0.72)	2.4	2	ND (0.72)	4.4	50
Exterior Expansion Joint Material	Expansion Joint - 1	ARCADIS	9/6/2012	ND (10)	ND (10)	39	ND (10)	39	50
	Expansion Joint - 2	ARCADIS	9/6/2012	ND (5.0)	ND (5.0)	41	ND (5.0)	41	50
	Expansion Joint - 3	ARCADIS	9/6/2012	ND (5.0)	ND (5.0)	46	ND (5.0)	46	50

NOTES:

1. ND = Not detected above laboratory method detection limit
2. Bold Values = Exceed Unrestricted High Occupancy Use Cleanup Standard
3. Total PCBs are the sum of detected arochlors only
4. * = Laboratory method detection limit exceeds PCB Bulk Product Waste Threshold

Table 4-
Summary of Laboratory Analytical Results-Substrate Samples
Cape Cod Community College
West Barnstable, Massachusetts

Substrata	Sample ID	Sample Depth	Sampling Date	Sampled By	PCB 1232	PCB 1242	PCB 1248	PCB 1254	PCB 1260	Total PCBs	Unrestricted Use Cleanup Standard
Brick Window Jamb	Brick-1A	0-0.5 Inches	5/15/2012	ARCADIS	ND (0.091)	ND (0.091)	ND (0.091)	0.38	ND (0.091)	0.38	1
	Brick-1B	0.5-1 Inches	5/15/2012	ARCADIS	ND (0.091)	ND (0.091)	ND (0.091)	0.54	ND (0.091)	0.54	1
			5/15/2012	ARCADIS	ND (0.091)	ND (0.091)	ND (0.091)	0.39	ND (0.091)	0.39	1
	Brick-2A	0-0.5 Inches	5/15/2012	ARCADIS	ND (0.10)	ND (0.10)	ND (0.10)	0.64	ND (0.10)	0.64	1
	Brick-2A-0-0.5in Split	0-0.5 Inches	5/15/2012	ARCADIS	ND (0.059)	ND (0.059)	ND (0.039)	0.525	ND (0.039)	0.525	1
	Brick-2B	0.5-1 Inches	5/15/2012	ARCADIS	ND (0.091)	ND (0.091)	ND (0.091)	0.25	ND (0.091)	0.25	1
	Brick-3A	0-0.5 Inches	5/15/2012	ARCADIS	ND (0.10)	ND (0.10)	ND (0.10)	0.49	ND (0.10)	0.49	1
	Brick-3B-0.5	0-0.5 Inches	5/15/2012	ARCADIS	ND (0.095)	ND (0.095)	ND (0.095)	0.58	ND (0.095)	0.58	1
	607JH-C-04	0-0.5 inches	6/9/2011	EnviroScience	ND (0.17)	ND (0.17)	ND (0.17)	**1.5**	ND (0.17)	**1.5**	1
Interior Concrete Lintel	Concrete-14A	0-0.5 Inches	9/11/2012	ARCADIS	ND (0.10)	ND (0.10)	ND (0.10)	0.22	ND (0.10)	0.22	1
	Concrete-14B	0.5-1 Inches	9/11/2012	ARCADIS	0.15	ND (0.091)	ND (0.091)	ND (0.091)	ND (0.091)	0.15	1
			9/10/2012	ARCADIS	0.1	ND (0.087)	ND (0.087)	ND (0.087)	ND (0.087)	0.1	1
Exterior Concrete Lintel	Concrete-15A	0-0.5 Inches	9/11/2012	ARCADIS	ND (0.095)	ND (0.095)	ND (0.095)	0.99	ND (0.095)	0.99	1
	Concrete-15B	0.5-1 Inches	9/11/2012	ARCADIS	ND (0.087)	ND (0.087)	ND (0.087)	0.33	ND (0.087)	0.33	1
Concrete Columns	609JH-C-02A	0-0.5 inches	6/9/2011	EnviroScience	ND (0.5)	ND (0.5)	ND (0.5)	**4.9**	ND (0.5)	**4.9**	1
	609JH-C-02B	0-0.5 inches	6/9/2011	EnviroScience	ND (0.5)	ND (0.5)	ND (0.5)	**3.6**	ND (0.5)	**3.6**	1
	609JH-C-02C	0-0.5 inches	6/9/2011	EnviroScience	ND (2.0)	ND (2.0)	ND (2.0)	**19**	ND (2.0)	**19**	1
	Concrete-13	0.5-1 Inches	9/10/2012	ARCADIS	ND (0.091)	ND (0.091)	ND (0.091)	0.13	ND (0.091)	0.13	1
Concrete Masonry Unit	CMU-1A	0-0.5 Inches	5/16/2012	ARCADIS	ND (0.087)	ND (0.087)	ND (0.087)	0.23	ND (0.087)	0.23	1
	CMU-1B	0.5-1 Inches	5/16/2012	ARCADIS	ND (0.091)	ND (0.091)	ND (0.091)	ND (0.091)	ND (0.091)	ND	1
	CMU-2A	0-0.5 Inches	5/16/2012	ARCADIS	ND (0.091)	ND (0.091)	ND (0.091)	0.67	ND (0.091)	0.67	1
	CMU-2B	0.5-1 Inches	5/16/2012	ARCADIS	ND (0.095)	ND (0.095)	ND (0.095)	0.12	ND (0.095)	0.12	1
	CMU-3A	0-0.5 Inches	5/16/2012	ARCADIS	ND (0.091)	ND (0.091)	ND (0.091)	0.25	ND (0.091)	0.25	1
	CMU-3B	0.5-1 Inches	5/16/2012	ARCADIS	ND (0.095)	ND (0.095)	ND (0.095)	ND (0.095)	ND (0.095)	ND	1
	CMU-4A	0-0.5 Inches	9/10/2012	ARCADIS	ND (0.091)	ND (0.091)	ND (0.091)	ND (0.091)	ND (0.091)	ND	1
	CMU-4B	0.5-1 Inches	9/10/2012	ARCADIS	ND (0.095)	ND (0.095)	ND (0.095)	ND (0.095)	ND (0.095)	ND	1
Concrete Window Sill	Concrete-3A	0-0.5 Inches	5/16/2012	ARCADIS	ND (10)	ND (10)	**60**	ND (10)	ND (10)	**60**	1
	Concrete-3B	0.5-1 Inches	5/16/2012	ARCADIS	ND (1.0)	ND (1.0)	**8.5**	ND (1.0)	ND (1.0)	**8.5**	1
	Concrete-3C	1-1.5 Inches	5/16/2012	ARCADIS	ND (0.10)	ND (0.10)	0.79	ND (0.10)	0.14	0.93	1
	Concrete-3D	1.5-2 Inches	5/16/2012	ARCADIS	ND (0.10)	ND (0.10)	**0.72**	**0.26**	**0.11**	**1.09**	1
	Concrete-4A	0-0.5 Inches	5/16/2012	ARCADIS	ND (4.8)	ND (4.8)	**37**	**17**	ND (4.8)	**54**	1
	Concrete-4B	0.5-1 Inches	5/16/2012	ARCADIS	ND (0.38)	ND (0.38)	**2.2**	**0.75**	ND (0.38)	**2.95**	1
	Concrete-4C	1-1.5 Inches	5/16/2012	ARCADIS	ND (0.095)	ND (0.095)	**1.1**	**0.73**	ND (0.095)	**1.83**	1
	Concrete-4D	1.5-2 Inches	5/16/2012	ARCADIS	ND (0.10)	ND (0.10)	0.53	0.25	ND (0.10)	0.78	1
	609JH-C-01A	0-0.5 inches	6/9/2011	EnviroScience	ND (0.19)	ND (0.19)	ND (0.19)	0.59	ND (0.19)	0.59	1
	609JH-C-01B	0-0.5 inches	6/9/2011	EnviroScience	ND (0.5)	ND (0.5)	**4.3**	ND (0.5)	ND (0.5)	**4.3**	1
	609JH-C-01C	0-0.5 inches	6/9/2011	EnviroScience	ND (4.3)	**37**	ND (4.3)	ND (4.3)	ND (4.3)	**37**	1
Interior Floor	Concrete-7A	0-0.5 Inches	9/6/2012	ARCADIS	59	ND (9.1)	ND (9.1)	ND (9.1)	ND (9.1)	**59**	1
	Concrete-7A Split	0-0.5 Inches	9/6/2012	ARCADIS	ND (0.59)	ND (0.59)	14.6	ND (0.59)	1.29	**15.9**	1
	Concrete-7B	0.5-1 Inches	9/10/2012	ARCADIS	9.3	ND (0.91)	ND (0.91)	ND (0.91)	ND (0.91)	**9.3**	1
	Concrete-8A	0-0.5 Inches	9/10/2012	ARCADIS	ND (0.45)	ND (0.45)	4.1	ND (0.45)	ND (0.45)	**4.1**	1
	Concrete-8B	0.5-1 Inches	9/10/2012	ARCADIS	ND (0.087)	ND (0.087)	0.21	ND (0.087)	ND (0.087)	0.21	1
	Concrete-9A	0-0.5 Inches	9/10/2012	ARCADIS	43	ND (8.7)	ND (8.7)	ND (8.7)	ND (8.7)	**43**	1
	Concrete-9B	0.5-1 Inches	9/10/2012	ARCADIS	31	ND (9.1)	ND (9.1)	ND (9.1)	ND (9.1)	**31**	1
	Concrete-10A	0-0.5 Inches	9/10/2012	ARCADIS	ND (0.091)	ND (0.091)	0.11	ND (0.091)	ND (0.091)	0.11	1
	Concrete-10B	0.5-1 Inches	9/10/2012	ARCADIS	ND (0.087)	ND (0.087)	ND (0.087)	ND (0.087)	ND (0.087)	ND	1
	Concrete-11A	0-0.5 Inches	9/10/2012	ARCADIS	96	ND (17)	ND (17)	ND (17)	ND (17)	**96**	1
	Concrete-11B	0.5-1 Inches	9/10/2012	ARCADIS	11	ND (0.87)	ND (0.87)	ND (0.87)	ND (0.87)	**11**	1
	Concrete-12A	0-0.5 Inches	9/10/2012	ARCADIS	ND (1.7)	ND (1.7)	18	ND (1.7)	ND (1.7)	**18**	1
	Concrete-12B	0.5-1 Inches	9/10/2012	ARCADIS	ND (4.3)	ND (4.3)	39	ND (4.3)	ND (4.3)	**39**	1
	Concrete-16	0-0.5 Inches	1/3/2013	ARCADIS	ND (0.095)	ND (0.095)	ND (0.095)	ND (0.095)	ND (0.095)	ND	1
			9/10/2012	ARCADIS	ND (0.096)	ND (0.096)	ND (0.096)	ND (0.096)	ND (0.096)	ND	1
	Concrete-18	0-0.5 Inches	1/3/2013	ARCADIS	ND (0.093)	ND (0.093)	0.17	ND (0.093)	ND (0.093)	0.17	1
	Concrete-18 Split	0-0.5 Inches	1/3/2013	ARCADIS	ND (0.208)	ND (0.208)	ND (0.208)	ND (0.208)	ND (0.208)	ND	1
Concrete Patio	Concrete-1A	0-0.5 Inches	5/16/2012	ARCADIS	ND (0.10)	ND (0.10)	ND (0.10)	0.87	ND (0.10)	0.87	1
	Concrete-1B	0.5-1 Inches	5/16/2012	ARCADIS	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND	1
	Concrete-2A	0-0.5 Inches	5/16/2012	ARCADIS	ND (0.10)	ND (0.10)	ND (0.10)	0.54	ND (0.10)	0.54	1
	Concrete-2B	0.5-1 Inches	5/16/2012	ARCADIS	ND (0.095)	ND (0.095)	ND (0.095)	ND (0.095)	ND (0.095)	ND	1
	Concrete-5A	0-0.5 Inches	5/16/2012	ARCADIS	ND (0.10)	ND (0.10)	**0.41**	**0.77**	ND (0.10)	**1.18**	1
	Concrete-5B	0.5-1 Inches	5/16/2012	ARCADIS	ND (0.095)	ND (0.095)	ND (0.095)	ND (0.095)	0.16	0.16	1
	Concrete-6A	0-0.5 Inches	5/16/2012	ARCADIS	ND (0.095)	ND (0.095)	ND (0.095)	**1.2**	ND (0.095)	**1.2**	1
	Concrete-6B	0.5-1 Inches	5/16/2012	ARCADIS	ND (0.095)	ND (0.095)	ND (0.095)	ND (0.095)	ND (0.095)	ND	1
	609JH-C-03A	0-0.5 inches	6/9/2011	EnviroScience	ND (0.087)	ND (0.087)	ND (0.087)	0.25	ND (0.087)	0.25	1
	609JH-C-03B	0-0.5 inches	6/9/2011	EnviroScience	ND (0.095)	ND (0.095)	ND (0.095)	0.22	ND (0.095)	0.22	1
	609JH-C-03C	0-0.5 inches	6/9/2011	EnviroScience	ND (0.087)	ND (0.087)	ND (0.087)	0.16	ND (0.087)	0.16	1

NOTES:

1. ND = Not detected above laboratory method detection limit
2. Bold Values = Exceed Unrestricted High Occupancy Use Cleanup Standard
3. Total PCBs are the sum of detected arochlors only
4. mg/kg = milligrams per kilogram, equal to parts per million (ppm)
5. Sample Brick-1B-0.5-1 in was the location of a field duplicate sample, both sets of results are reported in the table.
6. Double results indicates field duplicate sample was collected from that location

Table 7- Quality Assurance Sample Data- Field Splits
Cape Cod Community College
West Barnstable, MA

	Brick-2A-0-0.5in	Brick-2A-0-0.5in Split	RPD	Caulk-Black-3	Caulk-Black-3 Split	RPD	Caulk-Brown-5		RPD	Concrete-7A-0-0.5in		RPD	Concrete-18-0-0.5"		RPD
Sampling Date	5/15/2012	5/15/2012		5/16/2012	5/16/2012		9/10/2012	9/10/2012		9/6/2012	9/6/2012		1/2/2013	1/2/2013	
Laboratory	ConTest	Alpha		ConTest	Alpha		ConTest	Alpha		ConTest	Alpha		ConTest	Alpha	
PCB 1016	ND (0.10)	ND (0.059)	--	ND (9500) *	ND (361)	--	ND (0.68)	ND (0.25)	--	ND (9.1) *	ND	--	ND (0.093)	ND (0.208)	--
PCB 1221	ND (0.10)	ND (0.059)	--	ND (9500) *	ND (361)	--	ND (0.68)	ND (0.25)	--	ND (9.1) *	ND	--	ND (0.093)	ND (0.208)	--
PCB 1232	ND (0.10)	ND (0.059)	--	ND (9500) *	ND (361)	--	ND (0.68)	ND (0.25)	--	59	ND	--	ND (0.093)	ND (0.208)	--
PCB 1242	ND (0.10)	ND (0.059)	--	ND (9500) *	ND (361)	--	ND (0.68)	ND (0.25)	--	ND (9.1) *	ND	--	ND (0.093)	ND (0.208)	--
PCB 1248	ND (0.10)	ND (0.039)	--	ND (9500) *	ND (241)	--	2.2	ND (0.17)	--	ND (9.1) *	14.6	--	0.17	ND (0.208)	--
PCB 1254	0.64	0.525	20	120,000	7,730	176	ND (0.68)	1.06	--	ND (9.1) *	ND	--	ND (0.093)	ND (0.208)	--
PCB 1260	ND (0.10)	ND (0.039)	--	ND (9500) *	ND (241)	--	ND (0.68)	ND (0.17)	--	ND (9.1) *	1.29	--	ND (0.093)	ND (0.208)	--
PCB 1262	ND (0.10)	ND (0.020)	--	ND (9500) *	ND (120)	--	ND (0.68)	ND (0.08)	--	ND (9.1) *	ND	--	ND (0.093)	ND (0.208)	--
PCB 1268	ND (0.10)	ND (0.020)	--	ND (9500) *	ND (120)	--	ND (0.68)	0.546	--	ND (9.1) *	ND	--	ND (0.093)	ND (0.208)	--

NOTES:
1. ND = Not detected above laboratory method detection limit
2. RPD=Relative Percent Difference

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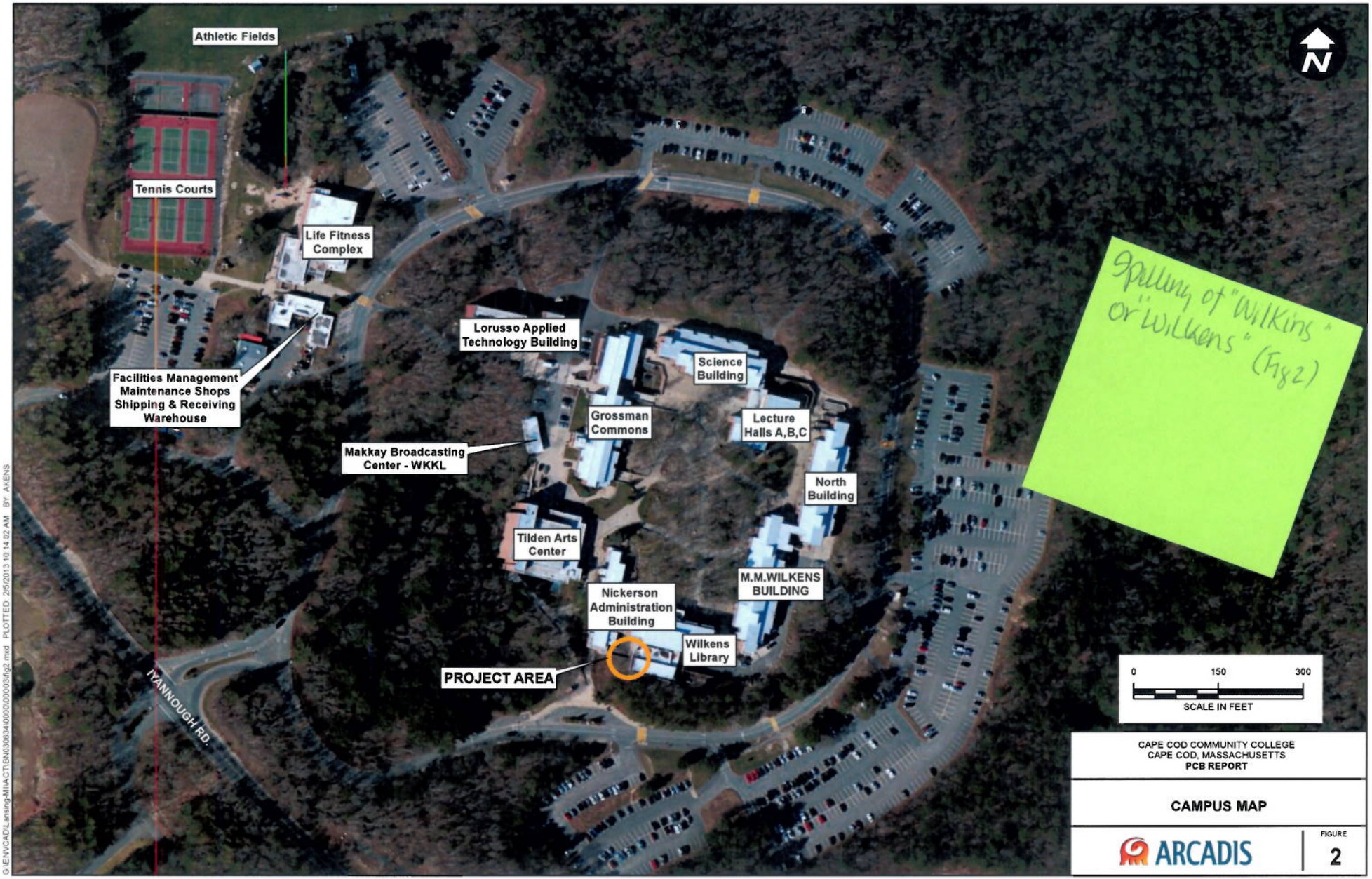
SITE LOCATION MAP

ARCADIS

FIGURE
1



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CAMPUS MAP

ARCADIS

FIGURE
2

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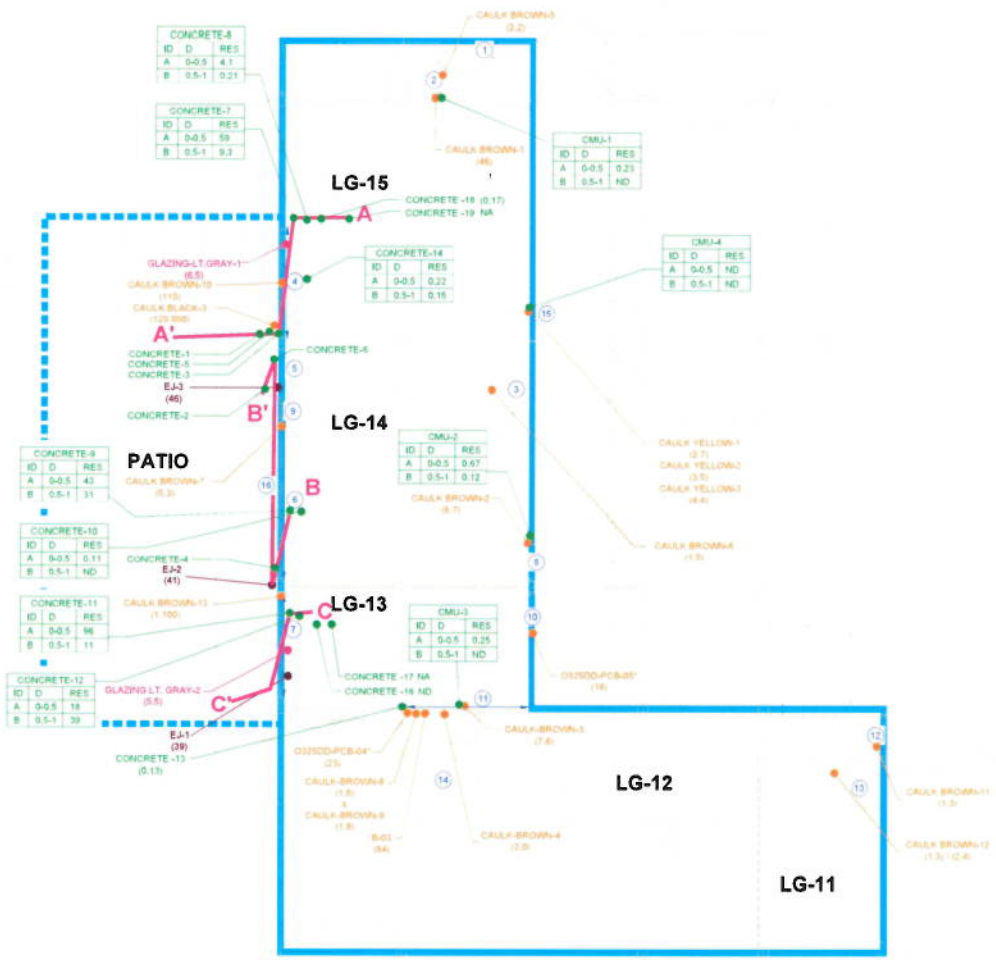

LEGEND

1	WINDOW OR DOOR NUMBERED FOR INVENTORY OF CAULK/GLAZING VOLUMES
2.1	CAULK SAMPLE (PCB CONCENTRATION, PPM)
3.6	SUBSTRATE (BRICK, CMU, CONCRETE) SAMPLE
13	GLAZING (PCB CONCENTRATION, PPM) SAMPLE
	LIMITS OF WORK
EJ-1 (39)	EXPANSION JOINT SAMPLE (PCB CONC, PPM)

ANALYTICAL RESULTS LEGEND

SAMPLE LOCATION ID	DEPTH OF SAMPLE FROM SURFACE (INCHES)	PCB CONCENTRATION (PPM)

ND = NOT DETECTED

* = LOCATIONS OF SAMPLES BY ENVIROSCIENCE BASED ON SAMPLE PLANS PROVIDED BY ENVIROSCIENCE AND ARCADIS FIELD OBSERVATIONS.

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BUILDING FLOOR PLAN AND INTERIOR SAMPLE LOCATIONS

ARCADIS

FIGURE
3